

WJEC (Wales) Biology A-level

Unit 3.1 - Importance of ATP

Flashcards

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What is ATP?



What is ATP?

- Adenosine triphosphate
- The universal energy carrier found in all living cells



Where is ATP produced?



Where is ATP produced?

ATP is synthesised on the internal membranes of mitochondria and chloroplasts.



Describe how ATP is synthesised.



Describe how ATP is synthesised.

- Involves **ATP synthase**, an enzyme found embedded in cellular membranes
- ATP synthase phosphorylates ADP to form ATP as protons flow through it



Compare the flow of protons across the mitochondrial and chloroplast membranes.



Compare the flow of protons across the mitochondrial and chloroplast membranes.

Mitochondrial membrane: H^+ flow from the intermembrane space into the matrix, across the inner membrane.

Chloroplast membrane: H^+ flow from the thylakoid space into the stroma, across the thylakoid membrane.



Define chemiosmosis



Define chemiosmosis

The synthesis of ATP through the movement of protons down their **electrochemical gradient** across a semi-permeable membrane, catalysed by ATP synthase.



How is the proton gradient maintained during chemiosmosis?



How is the proton gradient maintained during chemiosmosis?

Potential energy associated with excited electrons is coupled to the active transport of H^+ across the membrane by **proton pumps**.



What is the electron transport chain?



What is the electron transport chain?

A series of electron carrier proteins that transfer electrons in a chain of oxidation-reduction reactions, releasing energy.



How can dehydrogenase activity be investigated?



How can dehydrogenase activity be investigated?

Investigated using artificial hydrogen acceptors such as DCPIP, methylene blue and tetrazolium compounds.



What colour change is observed when DCPIP is reduced?



What colour change is observed when DCPIP is reduced?

Dark blue to colourless



What colour change is observed when methylene blue is reduced?



What colour change is observed when methylene blue is reduced?

Dark blue to colourless

